

SECTION 311030

GRANULAR FILL MATERIAL

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and obtain materials for filling and backfilling, grading and miscellaneous sitework, for the uses shown on the Construction Plans and as specified herein.

1.2 RELATED WORK

- A. Trenching, Backfilling and Compaction is included in Section 311020.

1.3 SUBMITTALS

- A. Submit, in accordance with Section 013000, complete product data for materials specified in this Section.
- B. Submit laboratory test results for all fill materials (maximum density, gradation, Atterberg limits, sand equivalent, etc., as applicable) at least 5 days prior to importing or placing any fill.

1.4 REFERENCED STANDARDS (LATEST REVISION)

- A. ASTM International (ASTM):

1. ASTM C33/C33 M - Standard Specification for Concrete Aggregates.
2. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft) (2700kN-m/m³).
3. ASTM D2487 - Classification of Soils for Engineering Purposes (Unified Soil Classification System).
4. ASTM D2974 - Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
5. ASTM D4632/ D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
6. ASTM D4751 - Standard Test Methods for Determining Apparent

Opening Size of a Geotextile

7. ASTM D5084 - Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
8. ASTM E11 - Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves.

B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.5 DEFINITIONS

A. Percent Compaction is the required in-place dry density of the material, expressed as a percentage of the maximum dry density of the same material, as determined in the laboratory by ASTM D1557 (Modified Proctor).

B. Optimum Moisture Content is the moisture content (percent by dry weight) corresponding to the maximum dry density of the same material as determined by ASTM D1557.

C. Moisture-Sensitive Soil is on-site soil containing more than 12 percent fines (silt- or clay-sized particles) based on the fraction passing the No. 200 sieve.

1.6 QUALITY ASSURANCE

A. The Quality Control and Quality Assurance consists of laboratory conformance testing of samples supplied from each granular fill and coarse aggregate source and quality control during installation.

B. The purpose of quality assurance testing is to assure that the supplied granular fill materials from each source conform to the Specifications.

C. Conformance testing requirements:

1. Materials to be used in the work shall be tested by a certified independent laboratory, engaged by the Contractor and acceptable to the Engineer, to demonstrate conformance with the requirements of these Specifications. Such testing will be paid for by the Contractor. At least fifteen (15) days prior to the placement of any backfill or fill materials, deliver a representative sample of the proposed materials weighing at least fifty pounds to the soils testing laboratory in accordance with Section 013000. For each source of fill material, the Contractor shall provide written documentation of the source of the fill and certification

that the fill material is clean and in compliance with applicable standards and regulations.

2. Testing methods shall comply with the latest applicable ASTM or equivalent AASHTO Standards specified.
3. All materials used in construction, whether brought to the site or developed from on-site sources, shall be tested for optimum moisture-maximum density curve, and reports of the test results for each source shall be submitted before placing materials. In addition, the soils testing laboratory shall perform the following test at a minimum frequency of 1 per every 200 cubic yards of material or when there is a change in material properties or source:
 - a. Grain size analyses of the samples to determine their suitability for use as backfill or fill material in conformance to the materials requirements specified herein.
 - b. The appropriate Proctor analyses to determine the maximum dry densities required for compaction testing as specified elsewhere in the Contract Documents.

- D. Test results and determinations of suitability shall be delivered to the resident project representative no later than 3 days prior to the placement of backfill or fill materials.

1.7 QUALIFICATIONS

- A. Perform the work by a qualified earthwork crew that has experience in processing and installation of granular fill materials. Demonstrate the earthwork crew's proven experience by providing a minimum of five (5) similar completed projects with the following information:
- B. Type and thickness of installed material and permeability;
- C. Name and purpose of facility, its location and date of installation; and
- D. Name of Owner and design Engineer. Name and telephone number of contact at the facility who can discuss the project.
- E. The supplier shall show evidence of an adequate supply of material which is relatively homogenous within a designated mine area which is properly permitted by the appropriate Federal, State and local agencies.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. If granular fill materials are delivered to the site prior to placement

approval, stockpile materials on site in areas as directed. Provision shall be implemented to minimize surface water impact on the stockpile. Removal and placement of granular fill material shall be done in a manner to minimize intrusion of soils adjacent to and beneath the stockpile.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill and Fill materials shall be suitable excavated materials, natural or processed mineral soils obtained from off-site sources, or graded crushed stone or gravel. Backfill and Fill materials shall be free of all organic material, trash, or other objectionable materials which may be compressible or which cannot be properly compacted. Soft, wet, plastic soils which may be expansive, clay soils having a natural, in-place water content in excess of 30 percent, soils containing more than 5 percent (by weight) fibrous organic materials, and soils having a plasticity index greater than 30 shall be considered unsuitable for use as backfill and fill. Backfill and fill materials shall have a maximum of 1 percent expansion when testing is performed on a sample remolded to 92 percent of maximum dry density (per ASTM D1157) at 2 percent below optimum moisture content under a 100 lbs/sq ft surcharge.

- B. Common fill shall consist of mineral soil, substantially free of clay, organic material, loam, wood, trash, and other objectionable material which may be compressible, or which cannot be compacted properly. Common Fill shall not contain granite blocks, broken concrete, masonry rubble, asphalt pavement, or any material larger than 6-in in any dimension. It shall have physical properties, as approved by the Engineer, such that it can be readily spread and compacted. Common Fill shall have a plasticity index of less than 15 and shall conform to the following gradation limits:

Sieve Size (ASTM E11)	Percent Finer by Weight
No. 200	12

- C. Select Common Fill shall be as specified above for common fill except that the material shall contain no stones larger than 2 in in its largest dimension and shall conform to the following gradation limits:

Sieve Size (ASTM)	Percent Finer by

E11)	Weight
No. 200	5

- D. Crushed Stone used in pipe trench within pipe zone, under abutments, and under concrete structures shall be crushed stone or gravel meeting the gradation and durability requirements of FDOT No. 89 and FDOT No.57 stone. Number 131 and 132 Screenings may be substituted for FDOT No. 89 and FDOT No. 57 stone.
- E. Filter Fabric: Mirafi, Type 140N; Dupont, Typar 3401, or equal product by Amoco, conforming to the following:
1. Minimum Grab Strength: 120 lbs per ASTM D4632/ D4632M.
 2. Apparent Opening Size: Equal to or greater than the U.S. Standard Sieve No. 70 per ASTM D4751.
 3. Percent open area not to exceed about 25 percent. The percent open area is defined as the ratio of the sum of 20 or more individual open areas (times 100) to the sum of the corresponding 20 or more individual total areas.
 4. Coefficient of permeability shall not be less than 10-2 cm/sec.

PART 3 – EXECUTION

3.1 MATERIALS

- A. Place materials in accordance with Section 311020.

END OF SECTION